STIMULATION OF AUTOMATIC BRAKING SYSTEM FOR A BIKE

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ABSTRACT

olden days life span of human is reduced. Death rate due to accident is drastically increased because vehicles usage is increasing by day by day. Due to brake failure so many accidents are occurring so when we control the brake by automatically we can reduce the effect of accident. A sensor setup is placed in front of vehicle and that setup consists of an emitter and receiver. Sensor emitter always emits the waves, whenever a obstacle is detected then wave gets reflected and receiver receives the signal. Reflected wave sends the signal to the pic from the based upon distance of object it actuates the buzzer or brakes. Brakes are actuated by using solenoid valve. Solenoid valve operated by electrical signal and it actuates brakes by using pneumatics. The glimpse into the future of automotive safety.

1. INTRODUCTION

Accidents occur due to technical problem within the vehicle or due to mistake of driver. Sometimes the drivers lose control over the vehicle and sometimes accident occurs due to rash driving. When the drivers come to know that vehicle is going to collide they become nervous and they don't apply the brakes. Majority of the accidents occur this way.The system designed will prevent such accidents. It keeps track of any vehicles in front. It will continuously keep the track of the distance between the two vehicles. When two come dangerously close the microprocessor(PLC) in the system activates the brakes and it will stop the vehicle.

The existing approaches in preventing accidents are:

Honda's idea of ABS which helps the rider get hassle free braking experience in muddy and watery surfaces by applying a distributed braking and prevents skidding and wheel locking [1] Volvo launched XC60 SUV which was equipped with laser assisted braking. This is capable to sense a collision up to 50 mps and apply brakes automatically [1] Drawbacks in the existing approaches: ABS can only help if the rider applies it in right time. Manually and maintains the distance calculations. ABS has its own braking distance. Moreover most of the commuter bikes in India don't have ABS because it's very expensive[2]. Volvo's laser assisted braking could not work effectively in rainfall and snowfall season and laser is easily affected by atmospheric conditions[3].

2.COMPONENTS

- BATTERY
- SWITCH
- MCB
- PLC
- SMPS
- SENSOR
- SENSOR
- ELECTROMAGENETS

- TO AND FRO MOTION MOTORS

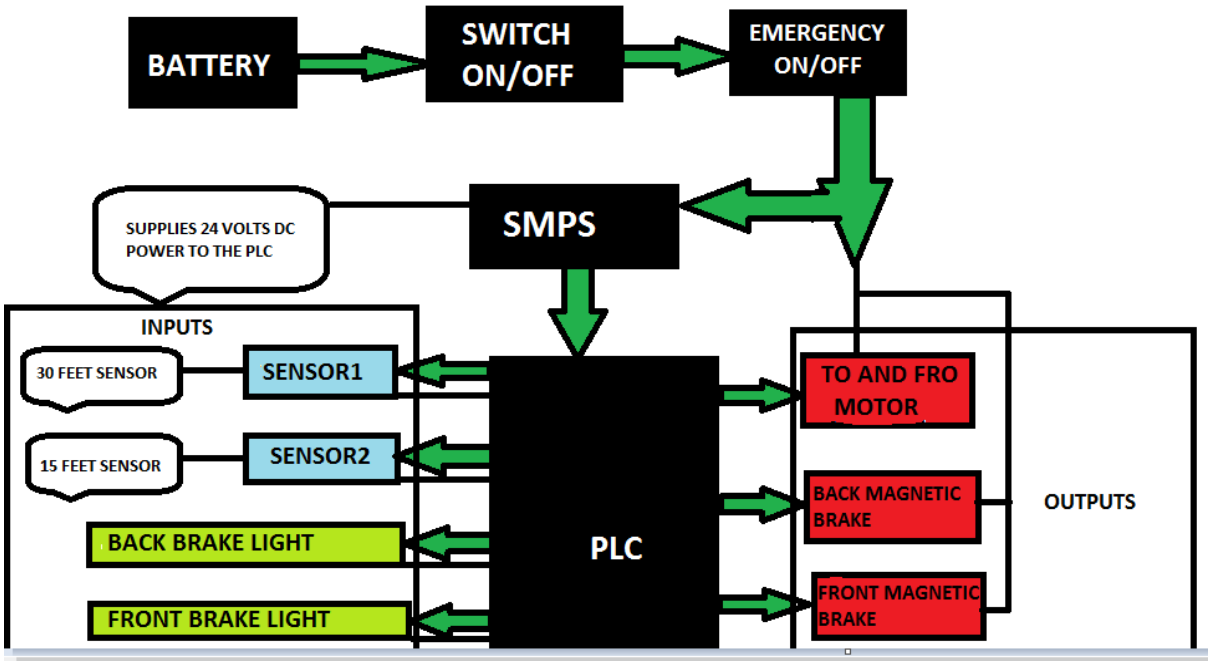


Figure 1. Braking System diagram

SWITCH

Elcom Push button switch in a Roundhead type, Momentary / ON-OFF type as per requirement.

MCB - A miniature circuit breaker automatically switches off electrical circuit during an abnormal condition of the network means in overload condition as well as faulty condition. Nowadays we use an MCB in low voltage electrical network instead of fuse.

3.PROGRAMMABLE LOGIC CONTROLLER

A **Programmable Logic Controller** (**PLC**) or **programmable controller** is an industrial digital computer that has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, robotic devices, or any activity that requires high reliability, ease of programming, and process fault diagnosis.

Delta DVP24XP200T 16 input 8 output Programmable Logic controllers

Figure 2. Programmable Logic controllers

No of Inputs (Digital/Analog) :16 input

No of Outputs (Digital/Analog) :8 output

Rated Power Supply :100-240 VAC

Program Memory :16k Steps

Operating Temperature : 50-55

20M RS485 SHORT RANGE LASER DISTANCE SENSOR

10M USB BACKNOARD LASER DISTANCE MEASURE SENSOR

Measuring Range → 20M

Storage Temperature → -25 — 60 degrees

Working Temperature → 0 – 40 degrees

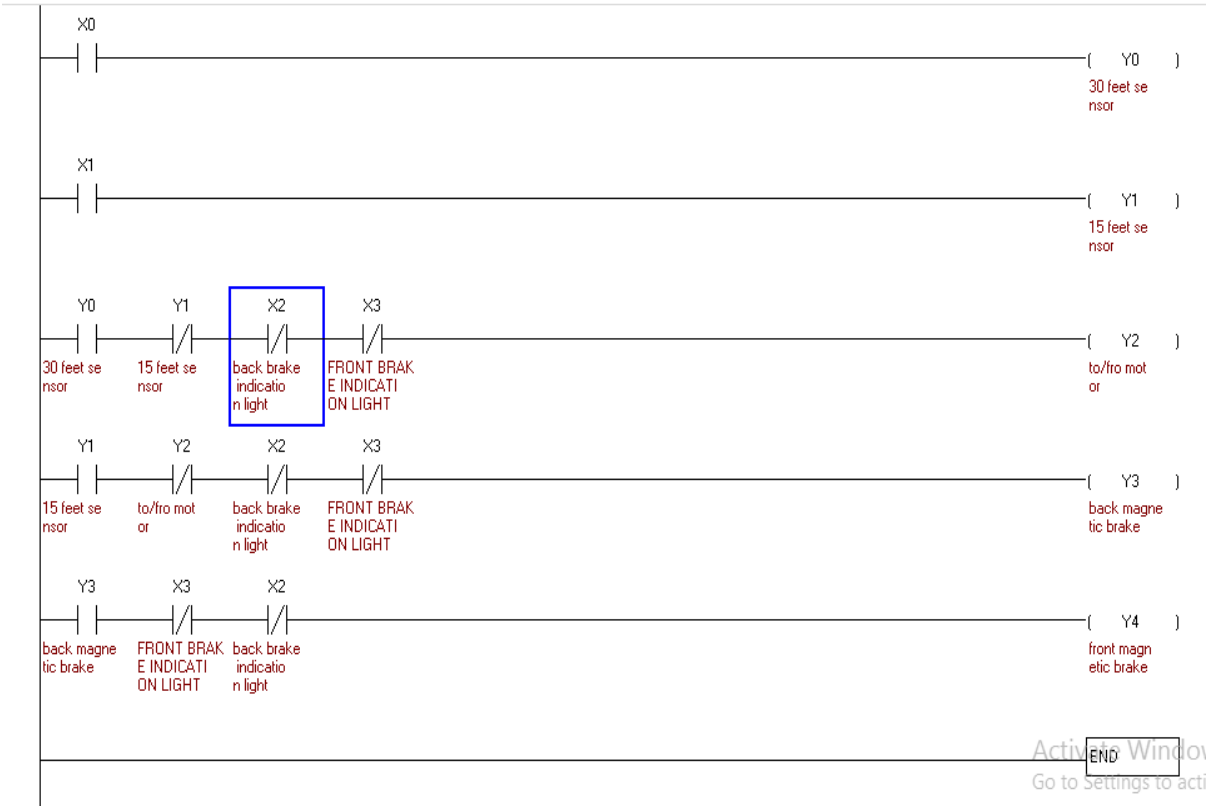
ELECTROMAGNETS

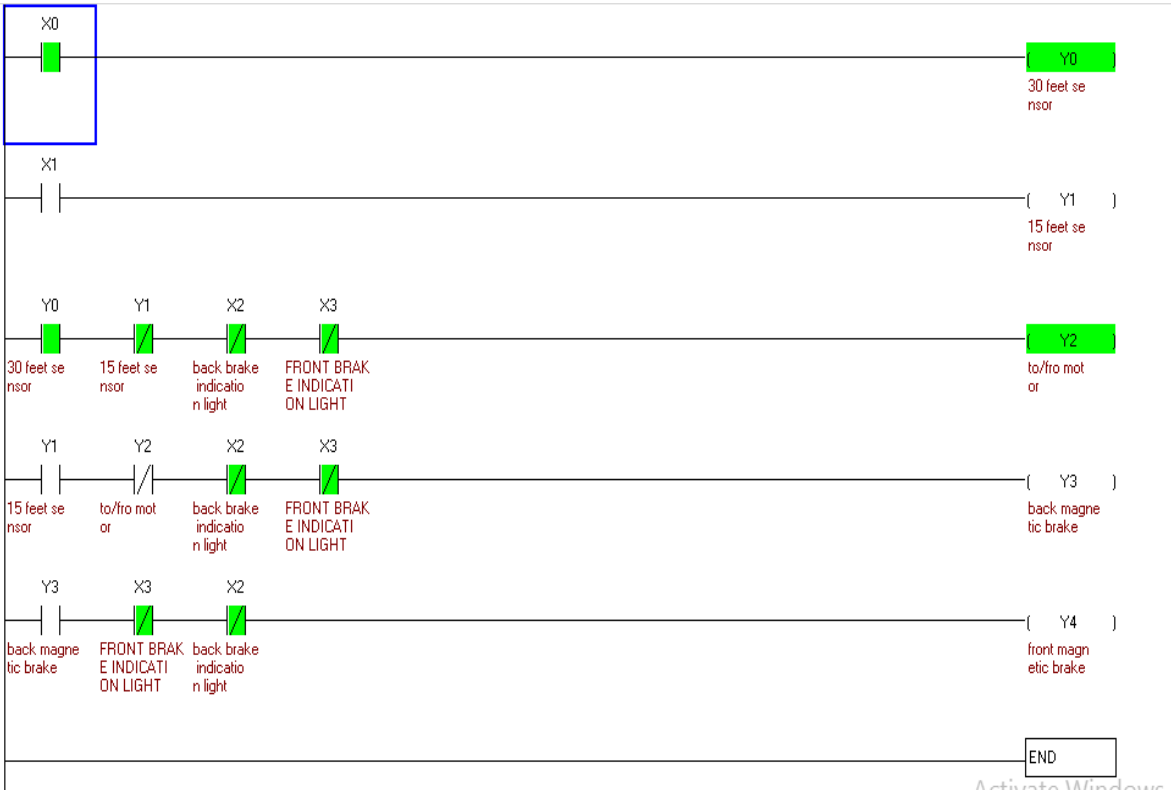
DC 12VKK – P60/60

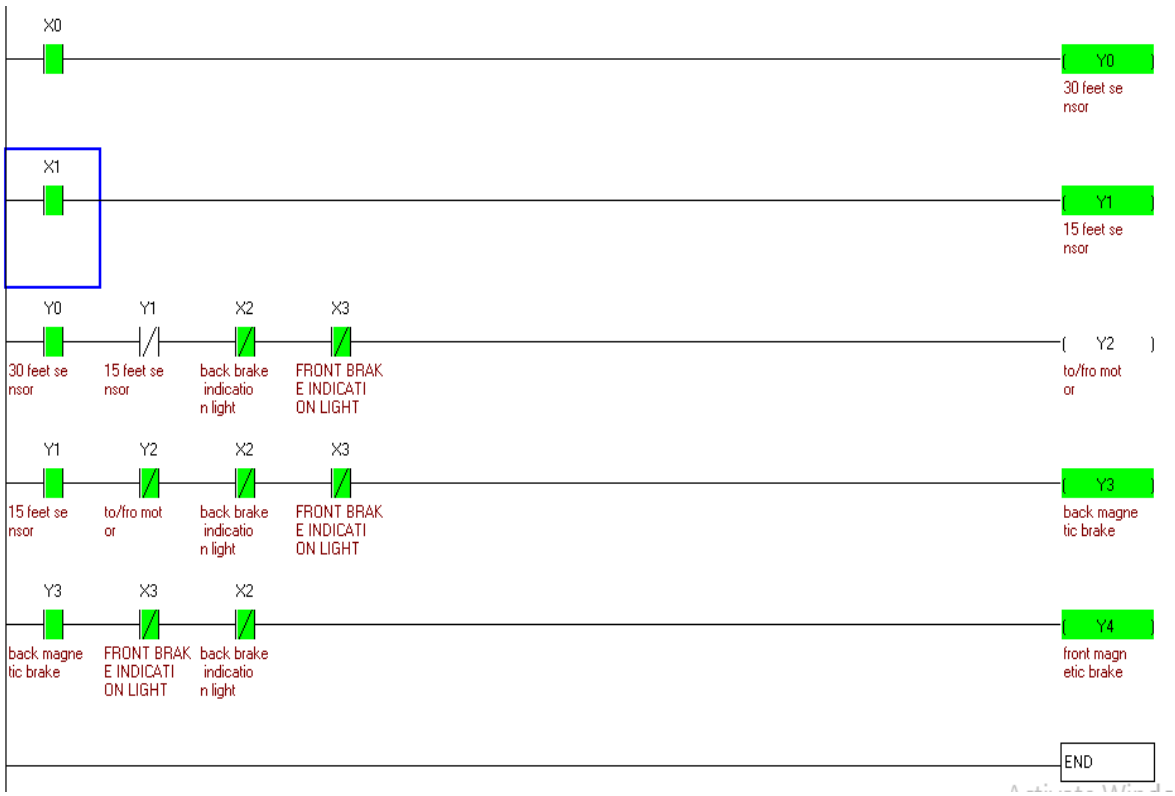
DC 12V KK-P60/60 Large Suction 100 KG Lifting Solenoid Electromagnet consist of an iron core and a coil to attract magnetic substances, using the magnetic action induced by electric current, only while the current is applied. This compact functional device offers high power with high reliability. The structure and design to release the residual magnetism left after de-energization is also one of its unique features.

1. Operating Voltage: 12V DC
2. Lifting Capacity: 100 KG
3. Size (D): 60 mm
4. Electric lifting magnet.
5. Powerful and compact.
6. Smooth and flat surface.
7. Low consumption and reliable.
8. Ambient temperature within 130 degrees.

LADDER LOGIC







Conclusion

stimulation of automatic braking system model is completed using PLC and this project presents the implementation of an automatic braking system for forward collision avoidance, intended to use in vehicles where the drivers may not brake manually, but the speed of the vehicle can be reduced automatically due to sensing of the obstacles. It reduces the accident levels

and tends to save the lives of so many people. By doing this project stimulation we gained the knowledge about working of automatic braking system and with this future study and research.

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